

REMARKS

Claims 1-18 are all the claims pending in the application.

Claims 1-3, 5-7, 9-11, and 13-16 are amended. New claims 19-30 are added.

In amended claims 1, 5 and 9, a Markush group is recited for the olefin. Support is found in the specification at page 3, lines 18-26.

The remaining claim amendments omit the term "having 3 or more carbons," which is unnecessary in view of the amendments to claims 1, 5, and 9 described in the preceding paragraph. No new matter is added.

Applicants' acknowledge, with thanks, the Examiner's indication of Applicants' claim to foreign and domestic priority and receipt of a certified copy of the priority document. Applicants note that receipt of the translation of the foreign language provisional application has not acknowledged in item 14a on the Office Action Summary. The translation was filed in the provisional application, and therefore, Applicants respectfully request that receipt be acknowledged.

Claims 13-16 are objected to under 37 C.F.R. § 1.75(c) as being in improper form because they are improper multiple dependent claims under MPEP § 608.01(n). In response, claims 13-16 are amended such that none of these claims depends from multiple dependent claims. Applicants respectfully request that the objection be withdrawn.

Claims 1-3, 5, 6, 8, 9, 10 and 13-18 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,861,531 ("Atkins"). For the purposes of this rejection claim 16 is considered to depend from claim 1.

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Claims 4, 7, 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Atkins as applied to claims 1-3, 5, 6, 8, 9, 10 and 13-18 above, and further in view of Froom et al (US 6,187,949).

It is conceded that Atkins does not disclose the amount of higher olefin in ethylene when ethylene alone is used as the olefin. It is asserted that Atkins does however disclose that alkanes are expected to be admixed therewith (column 3, lines 49-51). It is therefore presumed, in the absence of evidence to the contrary, that the ethylene employed by Atkins contains negligible or undetectable amounts of olefins having three carbons or more. Atkins' disclosure is therefore asserted to meet the recited upper limit on the amounts of olefins having three carbons or more. The position is taken that this presumption is supported by the fact that Atkins distinguishes between the use of ethylene and mixtures of ethylene and propylene.

In response, independent claims 1, 5, and 9 are amended to recite a Markush group wherein the recitation of polypropylene is omitted. Thus claims 1, 5, and 9 as well as the dependent claims 2, 3, 6, 10 and 13-18 are not anticipated by Atkins.

One of skill in the art, upon reviewing Atkins, would not view Atkins as disclosing the recitation in Applicants' amended claims that, in the starting materials, trans-2-butene, cis-2-butene and 1-butene appear in concentrations of 10,000 ppm or less.

Moreover, and in response to the rejection in combination with Froom, Applicants respectfully traverse the rejection under 35 U.S.C. § 103.

In the synthesis of an ester from ethylene and acetic acid in a vapor phase in the presence of a strong acid catalyst such as a heteropolyacid, butenes are generally produced. For example,

the product of Example 1 of the present application was precisely analyzed to have the following composition.

<u>Produced substance</u>	<u>Produced amount (g/hr)</u>
Ethyl acetate	191
Butyl acetate	0.012
Ethanol	4.6
Diethyl ether	3.4
Acetaldehyde	0.018
1-Butene	0.349
Cis-2-butene	0.697
Trans-2-butene	1.394
Low boiling point by-product	0.077
High boiling point by-product	0.017

If this reaction product gas is condensed, the condensed liquid is separated in a vapor-liquid separator and the uncondensed gas phase is recycled into a reactor as described in Example 1 of Froom et al., it is clear that the uncondensed butenes are recycled in view of the nature of butenes. However, in Table 8 of Froom et al., it is shown that the butene feed is 0. Thus, in view of the facts that the distillates from the top and bottom of the tower are 0, the distillate from the bottom of the tower is recycled to the reactor, and the stream fed to this tower is passed through the separator and the two distillation towers, it is considered that the butenes remain uncondensed at the previous step, particularly in the separator and the whole amounts of the butenes are recycled into the reactor and, therefore, the butene feed is 0 in Table 8. That is to say, Froom et al. merely teaches the conditions of the portion containing aldehyde, but does not

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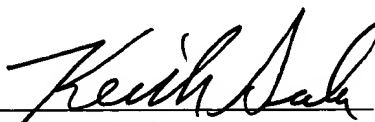
teach the recycle of whole portion. Therefore, it cannot be said that the description of Froom et al. that the distillate from the bottom of the tower containing no butenes is recycled into the reactor teaches that the feed to the reactor contains no butenes. Therefore, Froom neither teaches nor suggests that starting materials containing little butenes, i.e., containing butenes in an amount of 10,000 ppm or less, are fed so that the catalyst can be prevented from deteriorating.

Therefore, the present claims are clearly distinguished from Atkins and Froom, even in combination. It is respectfully requested that the rejection be reconsidered and withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


Keith B. Scala
Registration No. 43,088
Date: January 13, 2003

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 4, 8 and 12 are cancelled.

The claims are amended as follows:

1. (Amended) A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst and in a vapor phase, wherein the concentration of olefin [having 3 or more carbon atoms] selected from the group consisting of trans-2-butene, cis-2-butene and 1-butene in the starting materials is 10,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.
2. (Amended) The process as claimed in claim 1, wherein the concentration of the olefin [having 3 or more carbon atoms] in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.
3. (Amended) The process as claimed in claim 2, wherein the concentration of the olefin [having 3 or more carbon atoms] in the starting materials is 1,000 ppm or less in terms of the molar ratio to the total of the olefin and ethylene.

5. (Amended) A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst and in a vapor phase, wherein the concentration of olefin equivalent, selected from the group consisting of saturated alcohols having 4 or more carbon atoms, esters of a carboxylic acid and a saturated alcohol having 4 or more carbon atoms, and saturated ethers having 5 or more carbon atoms, which yields trans-2-butene, cis-2-butene or 1-butene, in the starting materials is 50,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and ethylene.

6. (Amended) The process as claimed in claim 5, wherein the concentration of the olefin equivalent in the starting materials is 25,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and ethylene.

7. (Amended) The process as claimed in claim 6, wherein the concentration of the olefin equivalent in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin equivalent and the ethylene.

9. (Amended) A process for producing an ester, comprising reacting a carboxylic acid and ethylene in the presence of an acid catalyst and in a vapor phase, wherein the sum of the concentration of olefin [having 3 or more carbon atoms] selected from the group consisting of trans-2-butene, cis-2-butene and 1-butene and one-fifth the concentration of olefin equivalent in

the starting materials is 10,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

10. (Amended) The process as claimed in claim 9, wherein the sum of the concentration of the olefin [having 3 or more carbon atoms] and one-fifth the concentration of olefin equivalent in the starting materials is 5,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

11. (Amended) The process as claimed claim 10, wherein the sum of the concentration of the olefin [having 3 or more carbon atoms] and one-fifth the concentration of olefin equivalent in the starting materials is 1,000 ppm or less in terms of the molar ratio to the total of the olefin and olefin equivalent and ethylene.

13. (Amended) The process as claimed in any one of claims 9 to [12] 11, wherein the olefin equivalent comprises at least one compound selected from the group consisting of saturated alcohols having 3 or more carbon atoms, esters of a carboxylic acid and a saturated alcohol having 3 or more carbon atoms, and saturated ethers having 5 or more carbon atoms.

14. (Amended) The process as claimed in any one of claims 1 to [13] 3, 5 to 7 and 9 to 11, wherein the carboxylic acid and ethylene is reacted in the presence of water.

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15. (Amended) The process as claimed in any one of claims 1 to [14] 3, 5 to 7 and 9 to 11, wherein the carboxylic acid is at least one of lower aliphatic carboxylic acids having from 1 to 4 carbon atoms.

16. (Amended) The process as claimed in any one of claims 1 to [15] 3, 5 to 7 and 9 to 11, wherein the acid catalyst comprises at least one compound selected from heteropolyacids and heteropolyacid salts.

Claims 19-30 are added as new claims.